Waste Reduction and Recycling Assistance for Businesses

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Some Results of Construction or Demolition Waste Management Projects completed under contract with WasteCap Wisconsin, Inc.:

Alliant Energy's Corporate Headquarters - Construction waste recycling

- 325,000 ft^2 commercial building
- 75% recycling rate by volume
- Over $15,000 saved through avoided disposal costs
- Efforts covered by local, statewide & national press

Affiliated Engineers, Inc. Corporate Headquarters - Construction waste recycling

- 52,000 ft^2 commercial building
- 70% recycling rate by weight
- No cost impact by recycling

Overture Arts Center Demolition Phase - Construction of 400,000 ft^2 Arts Center in downtown Madison, Wisconsin, resulted in demolition of six buildings

- WasteCap coordinated reuse days, documented reuse and recycling efforts
- Efforts covered by local, statewide & national press
- Reuse Results –26 Tons of Materials Reused
- Recycled: Ceiling Tile: 9 tons, Concrete: 4,920 tons, Carpet: 7 tons, Metal: 166 tons
- Overall Savings: $30,000 (includes cost for our services)

Metropolitan Builders Association of Greater Milwaukee – Residential construction waste recycling

- Wood and cardboard constitute an average of 50% of the residential construction waste stream in Wisconsin – The builders recycled 46% of their construction debris.
- Builders saved nearly 50% when using recycling dumpsters rather than trash dumpsters

Schlitz Audubon Nature Center - Construction waste recycling

- Project achieved a 78.7% recycling rate by weight
- Saved 42.5% of their disposal costs by recycling

Harley Davidson Product Development Center – Construction waste recycling

- Project achieved a 76% recycling rate by weight
- Saving over $10,000 and 40% of their disposal costs by recycling

Overture Arts Center Construction Phase – Construction waste recycling

- Current Recycling Rate: 52% by weight
- 34% savings (over $20,000) of disposal costs by recycling to date

Common Features:

- Disposal costs reduced or same
- Environmental benefits
- PR benefit to owner – projects highlighted locally, statewide & nationally
- Contractors and subcontractors find recycling simple and not time-consuming
- Partnerships – owner, contractor, subcontractors, architect "on board"
- Recycling included in project specifications
- Construction waste management plan
- Clear, large signs on dumpsters
- Education, monitoring and documentation

Frequently Asked Questions Regarding Construction Site Recycling

During the Retzer Nature Center Expansion Project, all job site crews will be asked to recycle construction waste. Here are some frequently asked questions about construction site recycling:

What if our firm has never recycled on a construction site before?

On site training will be provided by WasteCap Wisconsin for all contractors and workers. WasteCap Wisconsin, a nonprofit organization that provides waste reduction and recycling assistance to businesses, was hired by Waukesha County to help implement and document the construction waste recycling. They have helped contractors around Wisconsin successfully recycle their construction and demolition waste.

Is this going to take more time?

Not much. It is estimated that it takes 1-2 hours more per week for an entire jobsite to recycle construction waste. You just have to keep materials separate and put them in separate dumpsters. The dumpsters will be conveniently located. In conversations with contractors on other sites that recycle, contractors have noted that recycling is very simple and not at all time-consuming. In fact, contractors have noted that they have been surprisingly pleased with how clean job sites are that recycle and how little time it takes to separate recyclables from trash.

Is it going to cost more money?

Typically, recycling dumpsters are less expensive than trash dumpsters. Therefore, by recycling, sites typically save money. One site WasteCap Wisconsin worked with saved over $20,000 in disposal costs over 11 months by recycling their construction waste. Some sites buy lunches for job site crews with additional money saved/earned through recycling.

Who is responsible for getting the additional containers for the recyclable/reusable materials?

The general contractor is responsible for getting containers for disposal of all materials from the site. Make sure that your subcontractors remove any costs for dumpsters included in their bids.

Who is responsible for finding markets for the recyclable materials?

WasteCap Wisconsin will find markets for recyclable materials. Let WasteCap staff know if you know of a market for a particular recyclable material.

What materials will we be recycling?

It depends on local markets, but on other sites WasteCap has worked with the sites have recycled cans & bottles, cardboard & clean paper, concrete, drywall, scrap metal, and untreated wood.

Why are we being asked to do this?

Nationally, statewide and locally, recycling construction and demolition waste is becoming more and more common. In Wisconsin, there is more construction and demolition debris generated than residential, municipal solid waste. The Retzer Nature Center has a commitment to preserving the environment, and recycling construction materials saves natural resources, energy, and water. As the first Waukesha County building to recycle on a large scale, the Retzer Nature Center expansion project not only is a leader in construction waste recycling, but it will also serve as a training program for construction crews for recycling at future county building projects. Your cooperation in helping The Retzer Nature Center help the environment is appreciated.

Retzer Nature Center Expansion
Construction Waste Management Plan

I. Facility / Scope of Project:

The Retzer Nature Center expansion will include the addition of a basement, a new one-story building (Learning Center), and a Planetarium. The existing nature center will be retained and walls will be removed to join the existing center with the expansion. The new buildings will be constructed with cedar siding and asphalt shingle roofing. Floors will be concrete and drywall will be used to separate rooms.

The project will include demolition of two walls of the existing building, as well as replacing the shingles on the existing roof. The walls are fieldstone and concrete, with some portions covered by cedar siding.

The project will add 16,000 ft^2 to the existing 5,876 ft^2 building. Construction is expected to begin in late May or early June, 2004 and be completed by early 2005.

II. Analysis of Proposed Job Site Waste to Be Generated:

A. Projected construction waste materials:
- Land-clearing debris
- Clean, dimensional wood
- Pallets
- Plywood, OSB, and Particleboard
- Asphalt Shingles
- Concrete
- Fieldstone
- Cedar Shingles, Cedar Siding
- Cardboard, paper, packaging
- Metals
- Gypsum drywall
- 5-gallon paint buckets
- Plastics including stretchwrap/shrinkwrap and plastic bags
- Beverage containers
- Insulation scrap
- Miscellaneous - lunch wastes, floor sweepings

B. Based on the waste generation rates from projects of 50,000 ft2 and 327,000 ft2, this project is expected to generate 33 tons or 302 cubic yards of construction debris. With 50% diversion, Retzer Nature Center should recycle or reuse an estimated 16 tons of material. With 75% diversion, Retzer Nature Center should recycle or reuse an estimated 25 tons of material.

C. Projected quantities of construction waste materials generated on site. All materials are considered recyclables with the exception of trash.

	Estimated %	Estimated Tons	Cu Yd Per Ton	Est. Cu Yds
Trash	25.00%	8.4	6	50.4
Cardboard	10.00%	3.3	40	132
Drywall	14.00%	4.7	5	23.5
Metal	8.00%	2.7	8	21.6
Wood	36.00%	12.0	5	60
Concrete/Bricks	4.00%	1.3	2	2.6
Roofing Shingles*	2.00%	0.7	1	0.7
Commingled	1.00%	0.3	35	11
Total Recyclables	**75.00%**	**25.07**		**251.8**
Total	**100.00%**	**33.25**		**301.8**

III. Project Goals and Intent

Reduction, reuse and recycling of construction waste on the construction site of the Retzer Nature Center expansion is a joint effort of Waukesha County Department of Parks and Land Use; the contractor; Fisher, Fisher, Theis; all subcontractors; and WasteCap Wisconsin, Inc.

It is intended that the project shall minimize the environmental impact of construction and reduce waste. Methods shall be used that minimize waste due to error, poor planning, breakage, mishandling, contamination, or similar factors. As many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.

The Contractor and subcontractors shall reuse materials to the greatest extent practicable to eliminate or minimize the amount of reprocessing and pollution involved in recycling. Reuse includes the following:

1. Salvaging reusable materials for resale, for reuse on this Project, or for storage for use on future projects.
2. Returning reusable items (e.g., pallets or unused products) to the material suppliers.

All contractors and subcontractors will abide by the guidelines stated below. Our goal is to reduce or recycle at least 50% by weight of the construction materials generated from this site with an aim for a 75% recycling rate by weight. To reach this goal, the following items will be diverted from the landfill and recycled or reused.

IV. Materials-handling procedures

A. Reuse

Reuse is encouraged and if materials are going to be thrown away and a contractor or subcontractor can instead use the material, this is allowed and congratulated. There will be a Tracking Form for Materials Taken Off Site available to contractors and subcontractors to help account for any material removed from the site. In doing this, we are able to keep track of all the materials from this site. Subcontractors shall turn in this form on a monthly basis with the request for payment.

B. Cardboard and office paper

Cardboard and office paper includes clean cardboard, boxboard, office paper, colored office paper, magazines, and newspapers. It does not include tissue, paper plates or towels, or any item that is not paper. Cardboard that is over 50% covered with paint, mud or other contaminants should be disposed of as trash. Place in designated containers located on the job

site. To keep the containers free of contamination and water, they will be covered. A detailed list of acceptable items will be posted in the trailers and on/near each container. The cardboard and office paper will be sorted, bundled and sold to be made into new paper products.

C. Gypsum Drywall
Scrap drywall will be collected for use onsite. Keep absolutely free of contamination. Contamination includes screws, wood, and any other material that is not drywall. Place in area or dumpster designated by contractor.

D. Scrap metal
Place in designated container located on the job site. Metal will be hauled to a local metal recycler for processing. Place aluminum cans in the bin for cans & bottles, not the scrap metal container.

E. Wood
Wood includes packaging wood (e.g. from windows), pallets, clean dimensional wood, heavy wood beams (likely glue laminate), plywood, OSB and particleboard. Treated wood, cedar shingles and cedar shingle siding are not recyclable. Nails that are in the scrap wood may be included, but all other materials such as pieces of metal, cardboard or other materials are prohibited. The scrap wood will be chipped, dyed and used as landscaping mulch.

Subcontractors are strongly encouraged to reuse as much wood as possible. Dimensional lumber in good condition will be stockpiled for reuse when short-length pieces are needed. Scrap wood that is not reusable will be placed in a designated container located on the job site. Pallets that can be reused should be returned to contractors or suppliers for reuse.

F. Concrete and Fieldstone
Concrete and fieldstone will be collected and hauled to concrete or asphalt manufacturers for crushing as aggregate. Keep all dirt and organic materials out of the dumpster. If possible, some concrete and fieldstone will be incorporated into the retaining wall. Place in area or dumpster designated by contractor.

G. Asphalt Roofing Shingles
Asphalt shingles will be collected onsite in an area designated by contractor. The shingles will be incorporated into new asphalt paving by asphalt paver.

H. Plastic, glass, aluminum and steel bottles, jars and cans (commingled recyclables)
Place in labeled recycling bins located on job site near eating areas. When recycling bin is full, take to larger recycling container outside by other containers. Bottles, jars and cans need to be empty. Bottles and cans will be sorted offsite and recycled. A detailed list of acceptable items will be posted in the trailers.

I. Packaging
Specify minimal packaging when ordering materials. Find out if returnable packaging is available. Return packaging if possible (pallets, spools for electrical wire, etc.). If returnable packaging is not available, request recyclable packaging.

J. Other
All subcontractors are required to take note of what they are throwing away and come up with ways to minimize or eliminate the waste. Minimizing waste is our first priority – for example, returning reusable items (e.g. pallets or unused products) to the material supplier. Our second priority is to reuse – for example, storing reusable products to reuse on future projects. Our third priority is to recycle. If you are generating an item that is not being reused or recycled, please inform Waukesha County Department of

Parks and Land Use staff. Your ideas are needed and appreciated to come up with markets for these materials.

V. Meetings to be held to address waste management

Waste management plans and implementation shall be discussed at the following meetings

A. Pre-construction meeting
B. Regular job-site meetings

A WasteCap Wisconsin representative shall document the project through photographs; interviews with the site superintendent, owner, project manager, and subcontractors; written documentation, etc. and provide these results on a monthly basis at these meetings. The site superintendent shall address waste management on a weekly basis at regular job site meetings, review rules and address any contamination issues.

VI. Waste Auditing Procedures

All subcontractors are responsible for daily site cleanup and ensuring that all recycling containers are kept free of contamination. The site superintendent shall be responsible for daily checks of trash and recycling containers to check for and ensure the removal of contamination. Violators will be required to re-sort any misplaced waste and, if the problem continues, pay the cost of the container being disposed as trash rather than recycling. The site superintendent shall be responsible for contacting haulers for collection service.

Feedback from all workers is encouraged and should be given to the site superintendent, Waukesha County Parks and Land Use staff or WasteCap Wisconsin staff. In addition, feedback may be given at any of the meetings held to address waste management to determine if improvements need to be made to the reuse and recycling program.

A WasteCap Wisconsin representative shall conduct approximately one waste audit per month to assess if improvements need to be made to the recycling program. This assessment will include:

- interviews of job site crews to identify specific items that may be hindering the recycling program and to obtain input on ways to reduce, reuse and recycle materials from the site
- checks for mis-sorted materials in containers
- assessment of placement and labeling of containers and signs
- on-site instruction of appropriate separation, handling, and recycling, salvage, reuse and return methods to be used by all parties at the appropriate stages of the project.
- documentation of the process

RECYCLING INSTRUCTIONS

Material	What To Include	Do Not Put in Container
Commingled Recyclables	#1 and #2 plastic bottles Aluminum and Steel Cans Glass Jars & Bottles	No #3-7 Plastics No Plastic Spools, Plastic Bags, Caulk Tubes (even if #1 or #2)
Cardboard and Paper	Flattened Cardboard Office Paper Colored Paper	No Waxed Paper No Food Contaminated Paper (Coated with Paint, Mud, etc.) No Plastic or other Packaging
Scrap Metal	Scrap Metal (all types) Wire Painted Metal is OK	No Other Materials Attached to the Metal (e.g. Wood, Plastic) No Aluminum or Steel Cans (put in commingled recycling container)
Concrete & Fieldstone	Concrete, Rebar, & Fieldstone of any size	No Dirt, Organic Materials
Wood	Pallets Cutoffs, Wood scraps, Plywood, OSB, Wheat Board, Particle Board, Wood Packaging Other Untreated Lumber Nails OK	No Treated Wood No Wood used for Concrete Forms No Contaminated Wood (Painted, Oily, etc.)
Drywall	Clean, Unpainted Drywall	No Greenboard or Densglass NOTHING Other Than Drywall (No Screws, Trash, etc.)
Trash	Treated Wood Insulation Other Trash*	No recyclables No hazardous materials including car batteries, oil, etc. No yard waste No tires

PLEASE <u>REDUCE FIRST</u> , <u>THEN REUSE</u>, <u>THEN RECYCLE</u> –

ORDER MATERIALS IN REDUCED PACKAGING. REUSE CUTOFFS.

RETURN PACKAGING TO SUPPLIER WHEN POSSIBLE. ORDER RECYCLABLE PACKAGING.

* If you are generating a substantial quantity of any one material as trash, or if you have any questions about whether or not a material is recyclable, talk to Scott. **THANK YOU!!**

Creative Constructors LLC

Waukesha County Recycles

WasteCap Wisconsin

Steps to Setting Up a Construction Waste Reuse and Recycling Program

1. Plan

Get buy in from the owner. You can influence the owner to encourage them to recycle. Ask owner to put recycling into request for bids for contractors. The owner, contractor, subcontractors and architects will all need to be "on board"

Put recycling into specifications and into all contracts – sample spec language at www.wastecapwi.org

Design with waste reduction in mind

- Specify standard size materials (eg eight-foot lengths and 16 inch on center stud spacing to use entire boards, drywall sheets, etc)
- Ask suppliers to reduce packaging, send you recyclable packaging or take packaging back
- Specify building techniques that use less materials (eg reduce header sizes and corner details)

Select a coordinator – designate a staff member (typically construction project manager with the cooperation of the site superintendent) to promote and monitor the recycling program. The coordinator will educate staff and subcontractors

Identify target materials at the job site that can be recovered from the waste stream – What materials are you using for construction that could be recycled? What packaging do you expect on the site?

Develop a plan for the recovery of those materials

- Select hauler(s) and make arrangements for dumpster sizes and collection.
- Determine where to place containers, how many what type are needed, and when. Ideally recycling containers will be a different color and/or shape than the trash containers. Make sure to put a trash container near all recycling containers or the recycling container may become a trash container

The contractor should **write a Construction Waste Management Plan**. The owner and the architect can provide the contractor with information that will assist in the development of the Construction Waste Management Plan. The plan should include the following:

a. Description of building, site, and construction waste management plan manager
b. Description of waste management goals including source reduction
c. Estimate of the proposed job site waste to be generated, including types and quantities
d. Meetings to be held with job site crews to discuss waste management
e. Identification of materials that can be recycled or reused such as: corrugated cardboard, metals, concrete, brick, wood, plastic, glass, gypsum board, and other site-specific materials
f. List of materials from the Project that will be separated for reuse, salvage or recycling
g. Identification of proposed market for each recyclable material
h. Description of materials-handling, separation and storage requirements for recycling and reuse
i. Identification licensed haulers and processors of recyclables
j. Description of waste auditing procedures

2. Educate

A. **Set aside time to explain the program to the contractor and all of the subcontractors at the site**, and instill in them that is their responsibility to ensure that their laborers participate in the program

B. **Bring up waste management at <u>every</u> job site meeting**. Reminders are important.

C. Make sure that **every new person that comes onto the site is educated about the recycling program.** Include waste into your training program. The best way to educate crews is verbally. Educate them before or right when they come onto the site. This sheet can be given to crews as a reminder of separation requirements. Your hauler may be able to provide you with this type of handout.

D. Post **clear signs** that explain which materials go into which containers. It is essential to the success of the recycling program that each container is clearly marked. Your recycling service provider may help provide signs.
E. You can create a **sign for the fence** which promote success in the program to the public and reminds crews every time they come onto the site that yours is a recycling site. Tracking month-by-month progress can help to motivate crews to reach your recycling goals.

3. Monitor, Document, Make Adjustments and Celebrate Success

A. Periodically check the containers to ensure that the proper materials are going into them. If problems exist, find the person or people responsible and instruct them on how to properly participate
B. If you want to document all of the trash and recyclables that your construction project generated, track materials taken off site. This form can be submitted monthly with payment requests or the site superintendent can note materials taken off site and fill out the form with crews.
C. Have recycling service providers provide you with records of how much material is being removed and at what cost/savings (WasteCap can help you document and has sample spreadsheets for tracking). You may need to use conversion numbers (available from WasteCap) for some materials which are not able to be weighed.
D. Promote success in the program to managers, subcontractors, clients and the public. For example, one contractor took his employees on a company-sponsored fishing trip with the funds from recycling steel.
E. Do a final analysis which tells you whether you saved money or spent extra in disposal costs by recycling and tells you exactly how many tons and cubic yards of resources you saved. Evaluate the program and make it even better next time!